

Minutes: Sixteenth Meeting of the Alaska Scientific Review Group
10 March 2003
Seattle, WA

1.0 Introduction¹

This report summarizes the 15th meeting of the Alaska Scientific Review Group (SRG). The revised agenda is included as Appendix 1 and the list of SRG members and observers present is provided in Appendix 2. Appendix 3 provides a list of follow-up items and Appendix 4 is the handout provided on the Steller sea lion research framework and funding situation.

After a brief introduction of SRG members and observers present, Brendan Kelly adopted the agenda.

Angliss noted that it has become increasingly important that SRG members submit their travel vouchers promptly. Under new budgeting rules, NOAA Fisheries has to plan their budget on a quarterly basis, and any deviations from the planned budget have to be justified to headquarters in writing. Thus, if SRG members delay in submitting their travel vouchers, it will cause significant additional work for NMML staff.

Kelly noted that Lance Barrett-Lennard has now been officially appointed to the AK SRG via a letter from Laurie Allen, Acting Director of the Office of Protected Resources. Kelly also noted that Ralph Anderson has agreed to serve on the SRG but could not attend this meeting. Angliss indicated that the paperwork needed to officially appoint Anderson to the team would be submitted so that he would be on the team by the November 2003 meeting.

Kelly reminded the group that, at the last SRG meeting, the SRG indicated a need for additional expertise on AK state fisheries. Several good candidates were identified at the last meeting, and after brief discussion, the SRG recommended that Angliss contact a “short list” of candidates to ascertain their interest.

Finally, Kelly noted that Adkison was not present at the past two meetings and is interested in resigning because of other responsibilities. The SRG will not recommend replacing Adkison at this point, but will revisit this in the future if there is a need.

Angliss updated the SRG on the adoption of term limits for the SRG. At the last meeting, the AK SRG had recommended initiating a 3-year renewable term limit for SRG members to allow members to resign “gracefully” from the team. This issue was brought to Tom Eagle, who solicited input from the other SRGs. Neither the Pacific or Atlantic SRGs were interested in term limits; however, Eagle indicated that having a policy specific to the AK SRG would be acceptable. After some discussion, the AK SRG decided to adopt a policy of a 4-year term limit with the option to renew at the end of 4 years. SRG members at the end of their 4-year term will be queried at the fall SRG meeting regarding their willingness to serve for additional years. In

¹ This document is intended to summarize the main points of discussion at the 16th meeting of the Alaska Scientific Review Group. The document does not attempt to repeat everything that was said during the meeting.

order to initiate this new policy, SRG members who have been on the team the longest will be offered an opportunity to step down after the fall 2003 meeting. In preparation for implementing this policy, Angliss will provide a summary of when each SRG member was added to the team.

2.0 Steller sea lion research & management

2.1 Overview of SSL research framework & 2003 research plans – Lowell Fritz

Lowell Fritz, who coordinates interagency Steller sea lion research on behalf of the AFSC, provided an overview of the Steller sea lion research framework and an introduction to the research budget for 2003 (Appendix 4). AFSC SSL research can be grouped into 5 main categories; brief descriptions of these categories are as follows:

Steller Sea Lion Core Research: This is the NMML Steller sea lion research program described in detail in section 2.2.

Predation Research: Predation of Steller sea lions by killer whales and sharks has been listed as a potential cause of the SSL population decline and current lack of recovery. Shark predation has been virtually eliminated as a threat based on food habits studies conducted in 2001-2002; these studies have been concluded. The third year of a planned 3-year study of killer whale populations and food habits in western Alaska will occur in 2003.

Fishery-Interaction studies: These studies focus on the interactions between SSL and the pollock, cod, and mackerel fisheries in order to determine whether localized depletion in fishery resources occurs. In 2002, there were 11 studies and \$4.45M of funding in this category; in 2003, the program includes 6 studies and \$1.2M in funding.

Biophysical-climate change research: These studies, many of which were conducted in conjunction with the Pacific Marine Environmental Laboratory, have been severely curtailed in 2003 due to the reduction in funding. These studies focused on the current and long-term oceanographic properties of the Bering Sea.

Forage fish assessment: These projects focused on assessing species of non-commercial fish on which Steller sea lions forage. There were 10 projects funded in 2002 and only 1 project funded in 2003. Many of the projects initiated in 2002 continue into 2003 and 2004 because of long-term funding of post-doctoral fellowships and internships with 2002 funds.

In addition, 2003 SSL research funds are used to support the salaries of the AFSC's Steller Sea Lion research coordinator, provide funds to support the SSL research meeting in Anchorage, and limited support to other workshops and meetings which promote cooperative research (e.g., meetings to coordinate SSL predator research).

Fritz indicated that the following technical memorandum by Ferrero and Fritz (2002) provides a good overview of the history of Steller sea lion research, funding, and research coordination:

<http://www.afsc.noaa.gov/Stellers/NOAA-TM-AFSC-129.pdf>

Kelly questioned whether NOAA Fisheries expected the funding levels for Steller sea lions to continue to be highly volatile. Fritz responded that NOAA Fisheries did not expect the reduction in funds between 2002 and 2003, and indicated that the agency hopes that we do not continue to have a boom:bust federal budget. However, despite the reduction, NOAA Fisheries now has twice the budget for Steller sea lions relative to the budget for 2000, and all of the core research on abundance, trends in abundance, and vital rates will be conducted even under the current situation.

Gauvin questioned why NOAA Fisheries is considering the elimination of the Kodiak pollock study. Fritz responded that given the requirement to drastically cut back on days at sea for the NOAA RV Miller Freeman and the desire to complete the first pilot hydroacoustic survey of the entire Gulf of Alaska, it was difficult to schedule ship time for the Kodiak pollock study. Then, given the projected age distribution of the pollock stock and relatively low pollock fishing quotas, there was concern that there might be very little pollock fishing in the study area in August 2003. Loughlin added that it is important to the study design to dovetail the ship surveys with seasons when researchers can capture and tag Steller sea lions and that the available ship time in August is a very poor time for Steller sea lion captures.

2.2 NMML's 2003 Steller Sea Lion Research Plan

Tom Loughlin provided a summary of NMML's research plan for 2003. Overall, the amount of research conducted will be greatly reduced. However, the "core" SSL research, such as counts (required to assess population size and trend), branding (required to determine basic life history parameters), diet and foraging studies (required to determine what and where SSL eat), and genetics (required to ensure that the current stock structure has been identified correctly) will continue.

Pup counts and branding

Loughlin reported that counts and branding of SSL pups are conducted every year at several rookeries. Thanks to recent efforts, NMML and ADF&G have branded a little over 2000 pups. The proportion of pups captured and branded at a particular rookery varies. In order to minimize disturbance to rookeries, researchers only spend one day at each site to capture and brand animals. The maximum number of pups that can be branded in one day is approximately 200 animals. Thus, researchers may be able to brand most pups at smaller rookeries, but only a portion of pups at larger rookeries. Resight efforts include those from permanent field camps from May through mid-July; in addition, NMML conducts dedicated vessel resight surveys in May and the ADF&G conducts dedicated resight surveys in July.

A brand-resight workshop involving NOAA Fisheries and ADF&G staff was held in Anchorage two weeks ago. Each group branding Steller sea lions has a separate database for brand resights, but the databases are very similar, can be combined easily, and are shared regularly.

As a direct result of the branding efforts, new information on reproductive and survival rates should start coming in this year and in 2004.

Barrett-Lennard and Matkin questioned whether NMML was receiving the brand resights provided opportunistically by researchers working in Alaska on other projects. Loughlin indicated that these have been received, and stated that it is critical to provide picture of the branded animal to document and confirm the resight. Photographs of the branded animals are very important because the brand changes over time and because there is a lot of variation in how people read brands.

Kelly questioned whether there is a research plan for the branding program. Loughlin responded that they currently plan to brand for at least 5 years and continue resight efforts for at least 10 years. Branding is an excellent way to collect information on vital rates, so NMML plans to continue the branding program as long as funding is available.

Matthews pointed out that, given that predation has been identified as a potentially important reason for the lack of population recovery, it might be important to flipper-tag SSL so that tags might be retrieved from the stomachs of dead killer whales. Loughlin responded that NMML would not elect to tag because it is not possible to assume that tagging doesn't affect the survival of the animal. Kelly asked about progress towards using implanted PIT tags to identify animals. Loughlin indicated that these tags might be useful for some species, but not for SSL because the sensor would have to be within 1m of the animal in order to read the PIT tag and identify the individual.

Steller sea lion diet

Loughlin indicated that SSL diet would continue to be investigated using a variety of approaches, including scat analysis, prey field analysis, stable isotopes, and fatty acids. NMML works closely with other AFSC divisions conducting forage fish assessment and are integrating the scat analysis and telemetry research with the results of the fish assessment research.

Straley noted that, based on presentations given at the SSL meetings in Anchorage in January there seemed to be some variability in how scat was analyzed. Wynne responded that methods between researchers were actually quite standardized, but that there were some differences in interpreting what constitutes a "significant" prey item.

Steller sea lion foraging ecology

Loughlin indicated that NMML will continue to conduct foraging ecology studies using both radio and satellite telemetry. NMML staff are currently conducting dive captures and recently deployed instruments on 7 animals near Kodiak and 4 animals in Unimak Pass. The dive capture efforts are focused on collecting information on 2 and 3 year old animals, but some 9 month old animals are being collected as well. In combination, NMML and ADF&G have placed telemetry instruments on over 180 Steller sea lions.

When animals are captured for instrumentation, NMML staff collect a variety of specimens for NMML, ADF&G, and other co-operators, to assess health and condition of the animals. NMML

coordinates closely with other researchers to ensure that samples are collected in the same manner so that sample sizes can be easily combined.

Matkin noted that Randy Davis has started doing dive captures of SSL in Prince William Sound.

Loughlin noted that 2 different types of satellite tags are currently being used. Wildlife Computer's Satellite Depth Recorders (SDRs) provide information on dive depth, dive duration, maximum depth, time at sea, and time on shore. The Sea Mammal Research Unit's satellite dive tags provide more detailed dive information and are currently being deployed by NMML on behalf of Jennifer Burns at the University of Alaska. At this time, under half of the tags being deployed are from SMRU, but over the long term, NMML will probably transition to a higher proportion of the SMRU tags because they provide many more details about the environment through which the animals travel. The tags remain on the animals for between 5 days and a month, depending on when the animals are tagged. Loughlin pointed out that tracklines for animals can now be viewed near-real-time on NMML's website².

Lowry stated that researchers have made significant advances in captures and tagging of SSL, but the biggest controversy is how the data should be interpreted. Data interpretation will be particularly important if we start implementing some of the recommendations of the NAS report. Lowry asked what progress has been made in verifying assumptions, such as the verification of animal positions. Loughlin clarified for the SRG that the tags do not actually provide a position. Instead, a location is estimated via Doppler shift by the ARGOS satellite. Under certain situations (animal is only at the surface for a brief time or there are few satellites within the horizon at the time of surfacing), information on animal location can be very poor. Unfortunately, at this time there is no known technology that allows a better estimation of location. Lowry asked what progress has been made in testing assumptions about what constitutes a feeding dive vs. a traveling dive, which may lead to biases in the numbers of locations obtained when animal doing most of its time traveling. Loughlin noted that there may be instruments other than SDRs that could be used to get this kind of information, such as remote release devices that provide very detailed information about animal behavior during dives.

Barrett-Lennard asked about the objectives of placing satellite tags on Steller sea lions. Loughlin indicated that, in the past, they have been studying "dive behavior" using these instruments, but are now making the switch to a study of "foraging behavior" and are attempting to estimate foraging success.

Gauvin asked how animal positions are prioritized for analysis. Loughlin indicated that each animal position is assigned a grade between 3-Z based on the quality of the position information. Although only 10-15% of the locations are quality 3 or 2 (high quality), these apparently low percentages include thousands of animal locations. One bias already understood is the fact that high quality positions are more likely to occur near shore because animals tend to spend more time at the surface.

Field camps

²

See <http://nmml.afsc.noaa.gov/AlaskaEcosystems/sslhome/Satellite/satmain.htm>

Loughlin indicated that field camps will continue to be located at Ugamak, Marmot, and Fish Islands. Field personnel will conduct brand resights, population counts, document behavior, and study the effects of branding activities. One SRG member asked how NMML plans to study the effects of branding. Loughlin responded that the rookeries will be photographed before, during, and after the process, and that behavior, such as nursing, would be monitored.

Matkin asked whether the field camps could contact killer whale researchers when killer whales are seen. Loughlin indicated that this notification could be provided. . .but that it happens very infrequently.

Straley noted that NMML clearly expects some of the SSL branded 4 years ago to return to rookeries this year to pup. Straley asked whether an unbranded cohort needs to be available in order to do a comparison of reproductive and survival rates to determine whether there is an impact of branding. Loughlin indicated that, because individuals are not identifiable from birth, an “unbranded cohort” cannot be identified and tracked to allow direct comparisons.

Steller sea lion genetics

Genetic research on SSL is being conducted by Texas A&M (Bickham), SWFSC (Taylor/O’Corry-Crowe), and NMML researchers (Ream). The work is complimentary and samples are being shared between laboratories. Samples are currently being collected from animals handled for branding and from the subsistence harvest.

Lowry pointed out that, at the last SSL recovery team meeting, it was suggested that it may be necessary to designate Asian SSL as another stock, and asked about progress towards resolving this issue. Loughlin indicated that Bickham will visit the SWFSC in mid-April to discuss a different analytical technique called “boundary analysis” or “cluster analysis”, and discuss whether it would be useful to apply this technique to SSL. In addition, NOAA Fisheries will be convening a peer review group to review the genetic data and the boundary analysis approach to see whether it would be appropriate to split the western stock into Asian and US components. Kelly questioned whether there other possible stock boundaries being suggested for SSL. Loughlin responded that the SWFSC has a clustering analysis that is being used for this. Kelly further asked how the technique handles power issues. Loughlin indicted that he suspected that there were so many samples that power would not be an issue. Angliss clarified that the clustering analysis is the same approach being proposed as a way to designate boundaries between harbor seal groups in Alaska, and Kelly confirmed that this was the case. Barrett-Lennard pointed out that the SWFSC is leading the way on this new approach to interpreting genetic data. One of the major benefits of the approach is that it does not pre-determine the hypothesis; instead, groups of genetically similar animals cluster and the boundaries can then be selected after managers decide what level of difference between clusters is important for management purposes.

Additional Steller sea lion projects

The previous projects are all considered “core” SSL research. In addition to this work, a few high-priority studies will be pursued in 2003.

- NMML will attempt to capture adult SSL at Kodiak and Seward by trapping animals in a cage placed on a buoy. This method has been highly successful for capturing California sea lions in Washington.
- NMML will continue to support Vladimir Burkanov's work to summarize and compare US and Russia SSL management regimes. In addition, a small amount of funding will be provided to support his efforts to assess Steller sea lions in Russia, including pup counts, branding, and brand resights. Russian management zones; Russian pup counts & brand resights.

Straley pointed out that the Russia longline fishery has reported interactions with SSL, where SSL remove fish from the longline. Reports further indicate that fishermen are using acoustics to deter SSL. This was related to Sue Moore via email. Loughlin indicated that he was unaware of this report and stated that the only fishery interaction he was aware of was in a herring seine fishery.

Carry-over work from 2002

Loughlin indicated that some research was funded in 2002 but would be conducted in 2003. For instance, research and development of a remote release device for satellite tags, Russian field work, the remotely-operated video camera at the Benjamin Island rookery, and an NRC post-doc were funded out of 2002 monies. In addition, support for several Master's and PhD students would continue in 2003 (Lander, Sterling, Towell, Hennen, Browne, Trujillo, and Curgis).

2.3 National Academy of Sciences report on the Steller sea lion decline and fishery management

As background, the National Academy of Sciences was contracted in 2002 by the North Pacific Fishery Management Council to review and critique NOAA Fisheries' Steller sea lion conservation efforts. A report of this review was recently made available to the public. Kelly stated that the SRG is generally interested in the extent to which NOAA Fisheries finds the report useful, and whether there was anything in the report that was likely to change agency views about how the North Pacific ecosystem functions.

Kelly noted that one major recommendation from the NAS report was to designate large areas that are open and closed to commercial fishing in order to determine whether commercial fishing is actually responsible for population trends. Loughlin responded that this approach was identified years ago & has not yet been implemented. In addition, it is very difficult to test for effects of commercial fishing using only open/closed areas because Steller sea lions often move a lot. Essentially, you could close an area to commercial fishing, but animals from a rookery or haulout within the closed area may be foraging in a completely different area. Despite its attractiveness, adaptive management is really not practical. Kelly stated that the NAS report suggests closing areas near rookeries. Loughlin responded that animals are only confined at rookeries for 3mo; after this period, they travel long distances. He pointed out that this is also a concern when designing studies on Northern fur seals because it is not clear whether impacts to the northern fur seal population are caused in the Bering Sea, or elsewhere in the North Pacific where the seals occur for 9mo of the year.

Barrett-Lennard asked where Steller sea lions die. Loughlin noted that he does not believe that we will get a better idea of where they die, as we have not been able to resolve this with telemetry. However, thanks to the branding program, we should soon understand the age and sex of the animals that are dying. Loughlin cautioned that the dynamics of the population is being driving by only ~1200 unaccounted for mortalities, and that there is no way we can conclusively determine the fate of these few animals.

Wynne asked whether there are efforts to develop correction factors for abundance of Steller sea lions similar to what has recently been done for harbor seals³. Loughlin responded that some work has been done, as repetitive aerial surveys were conducted in 1997 and 2002. In addition, a correction factor could be developed using the telemetry devices to determine the proportion of animals not being surveyed. Finally, it is possible to use life tables from kills in the 1970s/80s to extrapolate pup counts to an abundance estimate, but because these data are dated, we do not know if they accurately reflect the current demographics. In time, information from the branding program will be available to construct life tables and extrapolate total abundance from pup counts. Abundance estimates calculated from counts are included in Loughlin et. al. and Trites et al., papers.

Kelly questioned whether it would be better to continue to focus on counts of animals and trends in abundance rather than attempting to develop correction factors and abundance estimates. Wynne replied that, for management purposes, it would be very useful to determine the actual abundance estimate in order to distinguish between how many animals are missing from the population and statistical variability in the survey/count procedure.

Kelly asked for a list of projects ongoing in 2003 that look at whether Steller sea lion dynamics are being driving by predation. Fritz indicated that NMML and other would be continuing another year of killer whale assessment. In addition, efforts would continue to quantify the subsistence harvest and to review past records to determine the extent of illegal shooting of Steller sea lions. Kelly asked how researchers would know if killer whales were driving the decline of Steller sea lions. Matkin responded that this is the objective of their research and that they intend to determine the size of the population of the groups of killer whales that forage on Steller sea lions. Barrett-Lennard added that they are attempting to determine the proportion of Steller sea lion mortality can be attributed to killer whale predation. Researchers are gradually convincing themselves that there is more killer whale predation on Steller sea lions than they originally expected, but the predation events do not appear to be occurring in the vicinity of rookeries and haulout sites.

In response to a comment that it would be very useful to attach mortality tags to Steller sea lions, Loughlin noted that Marcus Horning at Texas A&M University is currently developing a mortality tag that would be implanted internally. This tag was tested on a California sea lion carcass last year, and they hope to deploy the tags on Steller sea lions in 2004.

³ At this time, the Stock Assessment Reports for Steller sea lions include counts, not estimates, of abundance. This approach has been used because the aerial surveys are conducted when animals are on the rookeries, and the vast majority of animals can be counted during this period.

Straley noted that until research conducted in 2002, researchers didn't know whether the transient:resident model developed in the eastern Gulf of Alaska, British Columbia, and Puget Sound held true for western AK: researchers now know that this is the case based on genetics and behavior. One interesting preliminary result is that there seems to be far more transient groups than resident groups in southeast Alaska, where the Steller sea lion population is increasing or stable, and fewer transient groups in western Alaska, where the Steller sea lion population is declining. Matkin pointed out that it is not clear why the decline in Steller sea lions would be greatest in the area with the least number of transient killer whales if the decline was truly caused by predation.

Johnson noted that Fritz mentioned illegal shooting as a possible reason for the decline in Steller sea lions. Wynne noted that she and Matkin conducted surveys along the Copper River Delta to look for carcasses with evidence of gunshots; this evidence declined drastically after shooting marine mammals became illegal. Angliss indicated that she queries the Enforcement branch of NOAA Fisheries in order to get an estimate of the number of Steller sea lions shot; in recent years, there have only been a handful of reports. Lowry noted that Steller sea lions are not afraid of people, which suggests that the animals are not being shot.

Gauvin questioned how the NAS report would be used politically, and whether the agency would consider conducting a small-scale experiment involving open and closed areas near rookeries and haulouts. Loughlin indicated that this idea looks good on paper, but it might not be useful because, after a pup is 3 months old, it has the ability to travel long distances. It might be useful to attempt an experiment involving open and closed areas, but the areas would have to be selected based on the biology of the animals instead of the behavior of the fishery. The interpretation of the results will be difficult even under the best of circumstances, because we anticipate a lot of variability in the environment; given that, it's not clear how the results of an experiment could then be sufficiently generalized to become a useful fishery management tool. One SRG member noted that NOAA Fisheries was challenged in court for recommending an experiment that left some critical habitat open to fisheries, and asked how NOAA Fisheries will avoid court challenge if they choose to attempt to implement the NAS recommendations. Apparently, the NAS report offers some options for authorizing fishing in critical habitat; in addition, NOAA Fisheries has already made a strong argument that, despite the location of some fishing activity in critical habitat, the experiment as a whole would not jeopardize the continued existence of Steller sea lions.

Lowry stated his opinion that killer whales cannot be the ultimate cause of the decline in Steller sea lions; to him, it is pretty clear that something else went on to make the population "inclined to decline". He found it disturbing that the NAS report focused predominantly on comparisons between southeast Alaska and western Alaska Steller sea lion dynamics when deciding that the top-down hypothesis was the best. This comparison is quite inappropriate because the two stocks are genetically very different and we should not expect that the demographics and behavior to be similar. Gauvin commented that the report does not assert that killer whales were responsible for the decline, but are currently responsible for preventing recovery. Lowry responded that the Estes hypothesis, which is discussed in the report, includes both. Barrett-Lennard agreed that the available models do not support the hypothesis that killer whales could

have been responsible for the decline, but the models do support the hypothesis that predation could now prevent recovery.

SRG members asked how certain funds were going to be spent. At the time, it was believed that the North Pacific Fishery Management Council would use the \$2M appropriated by Congress to support a staff member with expertise on the ESA, and to support staff to help develop fishery management options that would better meet conservation goals. At the time, it was believed that the Alaska Fishery Development Foundation would use their \$2M to investigate killer whale deterrence techniques. At this time, the AFDF has used funds to support the installation of remote video cameras at haulout sites in hopes of documenting killer whale predation on Steller sea lions.

Matkin pointed out that there are considerable differences between transients groups in what they eat; some groups seem to be specialists on Steller sea lions. For instance, the AT1 group never forages on Steller sea lions, while other groups forage on Steller sea lions a lot. Barrett-Lennard cautioned that this may be seasonal or may not be true in all geographic areas: Ford authored a paper a few years ago which indicated that transients in British Columbia forage on whatever is locally abundant and don't seem to specialize on one or more species.

2.4 Final discussions

SRG members did have some concerns about what would be the most appropriate number to use for N_{min} for Steller sea lions. At this time, N_{min} is a count of Steller sea lions that is not adjusted for animals not seen when surveys are conducted. Although this method probably counts ~80% of the Steller sea lions, the remaining 20% becomes important when trying to determine the fate of the animals. For instance, it would be very important to know whether the 1200 animals estimated as “missing” from the population (see Loughlin and York, 2002) actually just represent “noise” in the data (e.g. – more animals were on the beach during one survey than during another, and this resulted in a difference of 1200 animals). It might be useful to try to create a life table for Steller sea lions using information from branded animals and use this to correct for the number of animals missed on the beach.

3.0 Northern fur seal abundance estimates (York)

Anne York provided an overview of the decline in northern fur seals over the past several years. Pup counts are significantly lower on St. Paul and slightly lower on St. George; the decline on both islands is about 5% per year. When the data are pooled, the decline is 5.2% per year ($SE = 0.19\%$; $p = 0.02$). At this time, the pup count at St. Paul is the smallest since 1922 and the count at St. George is below the 1916 pup count. The counts at both sites are 32% of the maximum recorded pup count.

Kelly asked why there are very narrow confidence limits in some years but not in other years. York indicated that, in some years, a full pup count is conducted, which results in very small error bars. In other years, pup counts are extrapolated based on the number of breeding males; during these years, the error bars are substantially larger.

York indicated that, in contrast, the number of pups born on Bogoslof Is has been increasing at a rate of 59% per year. While this increase is partially due to some migration from animals on the Pribilof Islands, the increase is insufficient to offset the decreases on the Pribilofs. The northern fur seal population on San Miguel Island experiences periodic crashes which coincide with major El Nino events.

Kelly asked why the population on the Pribilofs has been declining. York and Loughlin did not want to speculate. York pointed out that the median size of females is smaller than that in the 1950s, however, because there have not been systematic surveys of the size at age of adult females, it is unknown whether this change in size is significant.

Gauvin asked whether there are any known interactions between fisheries and northern fur seals. York responded that researchers are concerned that measures implemented to protect Steller sea lions might have shifted the fisheries into areas preferred by foraging northern fur seals. York asked whether there were any fisheries occurring in the winter in areas where the old pelagic gillnets used to occur; while squid jigs would not tend to have takes of fur seals, other gear types, such as pair trawling, might have takes. In response to a question from Angliss, Gauvin confirmed that there was no pair trawling taking place in the North Pacific.

Lowry clarified that for northern fur seals, the total population size is estimated by expanding the pup count by a factor of 4.5 (based on the old life history table) and taking the running average of 2-3 censuses of pups. York pointed out that there are no current data on pregnancy rates or survival, it is unknown whether the correction factor is still valid. Thus, for analysis of trends, using pup counts or bull counts would be better than comparing population estimates, as the expanded population estimates are probably only accurate within an order of magnitude.

Hills questioned the status of the populations in the Commander Islands. York indicated that the populations decreased for 2 years, then increased in 2002. The dynamics of the population in the Kuril Islands is unknown, the population at San Miguel Island has been increasing and decreasing, and the population at Bogoslof Island has increased. Although tagging data have indicated that some animals on Bogoslof have come from the Commander Islands, there are also some animals on Bogoslof that have traveled to the Pribilofs. In general, fur seals on Bogoslof Island have very short feeding trips and have been foraging primarily on myctophids.

Hills asked why a new expansion factor (from pups to adults) or correction factor (for animals missed during a census) was not being developed. York replied that, for northern fur seals, a new expansion factor or correction factor was not being pursued because the sample size would have to be very, very large. She reemphasized that it would be most useful to rely on the pup counts and bull counts to track trends in abundance.

Lowry noted that northern fur seals are currently listed as depleted under the MMPA. Given this status, he questioned whether the decline is causing NOAA Fisheries to be more concerned about fur seal conservation. Loughlin indicated that a few researchers are concerned, but that the issue had not yet become a major agency priority. Loughlin added that, at this time, there have been no efforts to determine the cause of the decline.

4.0 Dall's porpoise estimates

Kelly indicated that Dall's porpoise abundance estimates were on the agenda because of questions about the Nmin and the Turnock correction factor used to account for the fact that Dall's porpoise are attracted to ships.

Rod Hobbs provided a summary of the aerial surveys conducted by NMML. These aerial surveys were conducted in June/July, and covered the areas south of Cape Suckling, the central Gulf of Alaska, and the Alaska Peninsula and Bristol Bay in 1997, 1998, and 1999, respectively. Very few Dall's porpoise were seen during the Bristol Bay aerial survey. In addition, marine mammal observers were placed on bottom trawl surveys in eastern and western Bering Sea.

Preliminary abundance estimates from the aerial surveys conducted in 1997-99 results in an Nmin of 64,863. This abundance estimate has taken into consideration that ~25% of the Dall's porpoise groups are missed by the aerial survey observers (i.e., "perception bias") and that 30-50% of the Dall's porpoise were at the surface and available to be counted (i.e., "availability bias"). In addition, the aerial survey data were stratified into 113 separate regions to account for differences in density in different areas. The use of the aerial survey data eliminates the need to estimate a vessel attraction correction because the Dall's porpoise are not attracted to vessels. The Nmin of 64,863 is similar to that calculated by Lerczak and Hobbs (1993), although the methods were very different. The Nmin is conservative because there were some areas which could not be surveyed due to weather; no attempts were made to extrapolate a density to correct for missed survey effort.

Hobbs noted that the densities estimated from the aerial and vessel surveys in the Bering Sea are roughly comparable. No vessel attraction correction was applied to the vessel survey data because the use of 25x binoculars ensures that the animals are observed and recorded before they start to react to the vessel.

Matthews asked whether calves can be identified using aerial survey techniques. Hobbs noted that calves are seen, but are not recorded as such in the survey protocol. Matthews indicated that a recent paper speculated that there might be "nursery areas" where there are a lot of calves.

Straley noted that the group size resulting from the aerial surveys seems smaller than what is observed in Southeast Alaska. In that area, groups of 5-20 animals often occur. Hobbs noted that this seems reasonable, but that from the air, they look like different groups. Group size is very likely to be recorded differently from the air than from a vessel.

Hills questioned the source of the multiplier of 2 used to correct for availability bias. Hobbs responded that the availability bias is documented in a paper by Barlow that has been provided to and reviewed by the Pacific Scientific Review Group. Hills requested that the Alaska SRG also be provided with a copy of this paper⁴.

Hobbs noted that NMML will be initiating a new cycle of harbor porpoise surveys starting this year, and will be conducting an aerial survey of Southeast Alaska. Plans to conduct

⁴ Barlow 1997 was provided to SRG members at the end of the meeting.

simultaneous aerial and shipboard surveys in Southeast Alaska in 2003 could not be implemented.

Gauvin questioned whether the Bering Sea aerial survey was designed specifically to survey for Dall's porpoise or for some other species. Hobbs responded that the survey was designed to provide good estimates of harbor porpoise abundance, and that Dall's porpoise information was also collected. Abundance estimates have also been calculated from vessel surveys in the Bering Sea; these surveys are bottom trawl surveys for pollock which also carry marine mammal observers. Gauvin questioned whether the trawling could attract Dall's porpoise to the vessel and affect the abundance estimate. Lowry responded that this situation seems unlikely, since Dall's porpoise primarily forage on smaller fish, not the larger pollock targeted by the fishery.

Lowry questioned whether the aerial survey could be redesigned to get better estimates of Dall's porpoise. Hobbs indicated that some "tweaking" had already been done, and that the more recent surveys include areas beyond the shelf break in order to sample more Dall's porpoise habitat. Although there is a huge area in the EEZ that is Dall's porpoise habitat, these areas cannot be sampled with a twin otter.

Wynne asked whether the new abundance estimates for Dall's will be included in the new SARs. Hobbs responded that it will be included if the information can be compiled in time. Hobbs added that he hopes to circulate a draft manuscript for the SRG to review at the next SRG meeting.

Hobbs questioned whether the SRG was interested in discussing separating the Dall's porpoise stock into 2 or more stocks. Lowry indicated that the SRG could discuss this; however, no further discussion ensued. Lowry asked whether there was any concern about the level of incidental mortality and serious injury in commercial fisheries. Angliss replied that there has been a smattering of recorded takes in fisheries throughout Alaska coastal and offshore waters, but no apparent hotspots and the level of take appears to be consistently low. Straley stated that Mike Payne has indicated "concern" about level of take. Angliss indicated that she would speak to Payne about this concern.

5.0 Updates on previous SRG discussion topics

Eastern stock of SSL: Angliss reiterated that, while attempting to update the numbers of SSL presented in the SAR for the eastern stock, she noticed that there were discrepancies between the numbers in the old SAR and the numbers provided in 2002 by SSL researchers. The SAR for the eastern stock will not be updated until the reasons for the discrepancies can be identified. Lowry suggested that Ken Pitcher be consulted about this issue as he has been developing the summary of SSL abundance for the SSL Recovery Team.

Definition of serious injury: At this time, all animals reported as "released trailing gear" are considered "seriously injured", and are included with dead animals when calculating the levels of take for commercial fisheries. At the last SRG meeting, the SRG recommended that Angliss look into whether results of recent studies are available, particularly for humpback whales, which might provide better information on what proportions of entangled animals actually die as a

result of entanglement in gear. The Center for Coastal Studies was identified as a good place to find the results of this type of information. Angliss indicated that this had not yet been pursued. In addition, the SRG had recommended that NOAA Fisheries consider funding these types of studies if they were not currently being pursued. Angliss stated that she was aware of at least one proposal developed to address this, and suggested that the North Pacific Research Board or Large Whale Conservation Fund (administered by NFWF) might be good sources of funds for this type of project.

Lowry questioned whether the Alaska SRG could recommend that certain injuries currently considered “serious” be considered “non-serious”. Angliss responded that the definitions of “serious” and “non-serious” could be somewhat flexible since the operating definitions are in guidelines, not regulations. However, since NOAA Fisheries currently has published guidelines for what should be considered serious and non-serious, the preference is to rely on those published guidelines, and to officially change the guidelines if new information indicates that the guidelines need to be updated. Angliss further stated that it is far more defensible for the agency to follow published guidelines than to determine serious/non-serious purely on a case-by-case basis.

The SRG recommended that a test be done to determine whether the Alaska SRG members consider injuries due to entanglements serious or non-serious. Angliss agreed to circulate a table describing injuries to humpback whales to the SRG members, allow the SRG members to determine whether they feel, based on their expertise, that an injury is sufficiently severe to likely result in mortality, and to tabulate the results of the test.

North Pacific right whale critical habitat and appointment of a recovery team: Angliss indicated that NOAA Fisheries had not taken any additional actions regarding the designation of critical habitat for right whales, but that internal discussion were ongoing and that the issue was still on the agency’s radar screen. Angliss clarified that the Endangered Species Act does not require that the agency appoint a recovery team, and indicated that she had heard no rumors that a recovery team would be appointed for North Pacific right whales. However, a recovery plan is being developed and a draft plan will be made available for public comment.

Barrett-Lennard indicated that a Canadian recovery team had been convened for right whales, and that some NOAA Fisheries staff are participants. Kelly asked whether NMML was planning to tag right whales in 2003 per the SRGs recommendation at the fall 2002 meeting. Angliss indicated that this was the hope, but that NMML is unsure whether it could receive a scientific research permit in time for the 2003 field season.

Draft Protected Resources Stock Assessment Improvement Plan: Angliss indicated that NOAA Fisheries had hoped to have a draft plan developed in time to distribute prior to this meeting, but that progress on the draft plan was slower than expected. Angliss indicated that we hope to be able to make the draft plan available to the SRG by the fall 2003 meeting, if not before.

Rmax for central North Pacific humpback whales: At the last SRG meeting, Angliss proposed to increase the Rmax for central North Pacific humpback whales because recent

information indicated that the stock was increasing at a rate (~8.8%) which is above the default value of 4%. Staley had committed at that meeting to look into what Rmax has been used for other humpback whale stocks. Straley reported that the Pacific SRG uses 8% for the CA/OR/WA stock of humpback whales, and that the Atlantic SRG initially used 6.5% based on the Barlow/Clapham birth interval model but had returned to using the 4% default value because there were problems with the Barlow/Clapham analysis. Straley indicated that it may be possible to do a reanalysis of Calambokidis' 90-93 data to look at trends in abundance, and also indicated that she would work with Terry Quinn to determine whether trend information could be gleaned from the 1994-2000 Southeast Alaska humpback whale data. Barrett-Lennard suggested that it might be possible to calculate a Rmax using life history tables since information on calving rates and survival were available.

Barrett-Lennard updated the SRG on a new research effort directed at humpback whales which has recently been initiated. "SPLASH" – which stands for Structure of Populations, Levels of Abundance and Status of Humpbacks – will involve basin-wide humpback whale research with the goals of estimating current abundance, population structure, and information on trends in abundance in the North Pacific. Funding is expected from the NOAA National Marine Sanctuaries Program, from NOAA Fisheries' Large Whale Initiative, and hopefully other sources.

6.0) Bowhead whale abundance estimates

Angliss circulated the George et al. 2002 paper submitted to the IWC which provided the background for the new bowhead whale abundance estimate. Straley questioned whether 3.3 should be used for Rmax for this stock; Angliss indicated that this was the plan, and there was no further discussion.

7.0) "GAMMS II" workshop

Angliss indicated that the goal of the so-called "GAMMS II" workshop scheduled for fall 2003 (week of 15 September) is to review the guidelines for developing Stock Assessment Reports, and revise the guidelines if appropriate. The goal of bringing this topic to the AK SRG is to solicit their concerns and questions about current guidelines used to develop SARs prior to the workshop.

SRG discussions about the major agenda items for the "GAMMS II" workshop are as follows:

Guidelines for stock identification: Angliss indicated that there have been many recent situations where defining stocks under the MMPA have not been straightforward. NOAA Fisheries staff in the Science Centers and Regional Offices are interested in revisiting the guidelines for defining stocks and updating the guidelines if necessary to take into consideration advances in genetics techniques and genetic interpretation.

Standards of information to be included in the SARs: Kelly noted that the SRG has been inconsistent in its criticism of NOAA Fisheries about what information can be included in the SARs. Lowry indicated that the standards probably do not need to be completely consistent, but

that at a minimum, data to be included in the SARs have to be in some format that the SRG can review. The AK SRG were in concurrence that it is not necessary to have information available in a peer reviewed publication prior to inclusion in the SARs, but that a summary of the methods, results, and interpretation should be provided to the SRG prior to inclusion. Thus, a presentation of the data is not sufficient, but a presentation accompanied by a summary of the methods etc may be considered sufficient.

Default recovery factors: SRG members had many questions about the use of defaults for recovery factors and other parameters in the PBR equation. SRG members generally felt that Barb Taylor was moving in the right direction with her manuscript about setting default recovery factors, but had concerns about defining units of measurement (eg – the default recovery factor would be very different if humpback whale feeding aggregations were considered to be stocks). Straley indicated that, for some stocks, the population may naturally be quite small (e.g., humpback whales in Southeast Alaska), and in these cases, it is not clear whether the default recovery factor should be very low.

Hills requested an update on how the default values in the PBR equation were derived.

Finally, SRG members were interested in a discussion of the information necessary before deviations from the default values in the PBR equation could be justified. For instance, could a R_{max} based on data for one stock be used to justify a deviation from the default value for a similar stock? Barrett-Lennard suggested that NOAA Fisheries might conduct a reanalysis of R_{max} values for those species where good information is now available to put reasonable bounds on R_{max} default values.

8.0 Closing

The fall 2003 meeting of the Alaska SRG will occur on 18-19 November in Anchorage. A list of follow-up items is included in Appendix 3.

Appendix 1: Revised agenda

REVISED DRAFT AGENDA ALASKA SCIENTIFIC REVIEW GROUP MEETING 10 MARCH 2003

- 1) Adoption of agenda
- 2) Adoption of minutes
- 3) Administration
 - Travel
 - Membership
- 4) Introductions
- 5) Steller sea lion research and management
 - Background: National Academy of Sciences report:
<http://www.nap.edu/books/0309086329/html/>
 - Marine Science Symposium – Steller sea lion reports:
<http://www.afsc.noaa.gov/stellers/symposium2003.htm>
 - Overview of SSL research framework & 2003 research plans (Fritz)
 - NAS report (discussion)
 - Update on eastern stock numbers (Angliss)
- 6) Northern fur seal abundance estimates¹ (York)
- 7) Updates on previous SRG discussion topics
 - Duration of SRG member appointments (Angliss)
 - Definition of serious injury; do all entanglements = mortality? (Angliss)
 - N. Pacific right whale actions? Recovery team? (Payne)
 - Draft SAIP update (Angliss)
 - R_{max} for humpback whale stocks (Straley)
- 8) Dall porpoise N_{min} estimate (Hobbs)
- 9) Bowhead whale abundance estimates¹

10) Discussion of potential “GAMMS II” workshop topics

The report of the GAMMS workshop is at:

<http://nmml.afsc.noaa.gov/library/gammsrep/gammsrep.htm>

Possible topics for discussion:

- Guidelines for stock identification
- Standards for information that is used in the SARs
- Default recovery factors for endangered species
- Procedural issues

Appendix 2: Attendees

SRG Members

Brendan Kelly

John Gauvin

Beth Matthews

Charlie Johnson

Craig Matkin

Lance Barrett-Lennard

Jan Straley

Lloyd Lowry

Sue Hills

Kate Wynne

Robyn Angliss

NOAA Fisheries

Sue Moore

Anita Lopez

Keri Lodge

Tom Loughlin

Lowell Fritz

Appendix 3: Follow up items

- Process issues:
 - recommend that discussion of each agenda item start with a introduction that indicates why the item is on the agenda
 - Add dates and authorships to documents circulated to the SRG
- The SRG would like to review the Hobbs manuscript on Dall's porpoise abundance in Alaska
- The SRG would like to add a discussion of the Rmax defaults to the GAMMS workshop. In particular, the SRG would like to discuss:
 - What kinds of data are needed to deviate from the default values for Rmax?
 - Could simulations be run to be more species-specific?
- The SRG remains interested in the guidelines for what constitutes a serious injury to a marine mammal. To this end, the SRG asked that Angliss circulate a table describing humpback whale entanglements; SRG members would independently evaluate the descriptions and make a recommendation regarding whether each injury should be considered non-serious or serious, and thus likely to lead to mortality.
- Straley will look into what data supported the 8% Rmax for the OR/WA/CA humpback whale stock.
- SRG recommendation to NOAA Fisheries: The SRG recommended that NOAA Fisheries consider using all information in hand, information being collected (eg – branding information) or on other otariids that provides correction factors that gets you from counts to abundance [ask NMFS to use available data to quantify the negative bias of using adult & juvenile counts as the estimate of population size of SSL – need to know sightability, availability] It is important to know the abundance because when we start accounting for bodies, can't deal with Nmin as a point estimate. We know that the current life table is wrong because it's based on an increasing population!
- The SRG asked that Angliss provide a list of stocks up for review at the fall SRG meeting.

Appendix 4: Overview of the Steller sea lion research framework and an introduction to the research priorities for 2003

Congressionally Delegated Steller Sea Lion Funds Distribution	Millions of dollars			
	FY00	FY01	FY02	FY03
NMFS Steller Sea Lion Research	1.95	7.85	17.65	5.85
NOAA OAR Climate Change	-	6.00	6.00	-
NMFS NOS Predator-Prey	-	2.00	2.00	-
Federal Recipients	1.95	15.85	25.65	5.85
Steller Sea Lion Research Initiative	-	15.00	-	-
North Pacific Fisheries Management Council	-	2.00	2.00	2.00
Alaska Department of Fish and Game	1.10	2.50	2.50	2.00
North Pacific Universities Marine Mammal Research Consortium	0.80	0.80	3.50	2.50
University of Alaska - Gulf Apex Predator Project	-	1.00	1.00	1.00
Alaska SeaLife Center	1.00	6.00	5.00	5.00
Alaska Fisheries Development Foundation	-	-	0.50	1.00
Non-Federal Recipients	2.90	27.30	14.50	13.50
Total	4.85	43.15	40.15	19.35

Alaska Fisheries Science Center's Steller Sea Lion Research By Topic (approximate budgets in millions of dollars)	FY02		FY03	
	Budget	Projects	Budget	Projects
Steller Sea Lion Core Research (NMML, ABL, RACE, REFM)	7.76	26	3.06	12
Predator Assessment (NMML, ABL)	0.81	2	0.45	1
Sea Lion-Fisheries Interaction (REFM, RACE, ABL)	4.45	11	1.20	6
Biophysical-Climate Change Research (RACE, ABL)	1.38	7	0.40	3
Forage Fish Assessment (REFM, RACE, ABL)	1.70	10	0.20	1
Management and Research Support	3.45	-	0.50	-
AFSC Total (in FY02, includes \$1.9 M from NOS)	19.55	56	5.81	23

Congressionally Delegated Steller Sea Lion Funds Distribution	Millions of dollars			
	FY00	FY01	FY02	FY03
Oceanographic Processes (NOAA OAR PMEL)	3.91	4	0.04	1
funded from NOAA-OAR in FY02, from NMFS in FY03				

AFSC's FY03 Steller Sea Lion Research Priorities

Steller Sea Lion Core

Foraging and Marine Habitat Use (particularly older juveniles)

Vital rates (pup brand/resight)

Enumeration (pup counts)

Diet (scat studies)

Predation

Killer whale assessment (last year of planned 3-year effort)

Sea Lion-Fisheries interactions

Atka mackerel fishery in the Aleutians (tagging for local abundance and movement)

Pacific cod fishery in the eastern Bering Sea (localized effect of winter trawl fishery)

Walleye pollock fishery (plan for FY04)

Climate Change and Forage Fish Research (including oceanographic processes)

Continue with studies begun in FY02 for which multiple years of funding was secured

Retrieve equipment deployed in FY01-FY02

(PMEL)